TUBE TEST CONDITIONS
FOR
HICKOK CARDMATIC TUBE TESTER

MODEL KS-15874-L1 ART L-2

The HICKOK ELECTRICAL INSTRUMENT CO.
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2490-364

MODEL KS-15874-L1 AND L-2
SYMBOL DEFINITIONS

Ckt	Circuit
Cl	Load Capacitor
Eb	DC Positive Voltage applied to the Plate
Ebb	DC Plate Supply Voltage
Ec	DC Negative Voltage applied to the Control Grid
Ec2	DC positive Voltage applied to the Screen
Ec3	DC Negative Voltage applied to G3
Ef	Filament or heater Voltage
Epp	AC Plate Supply Voltage
Etd	Plate to Cathode Tube Voltage Drop
F-W	Full-Wave, Rectifying Circuit
G1	Grid nearest Cathode
G2	Grid second from Cathode
G3	Grid third from Cathode
Gm	Mutual Conductance
H-K	Heater-Cathode leakage reject value in microamperes
H-W	Half-Wave, Rectifying Circuit
Ib	Plate Current
Ik	Cathode current
Io	DC Component of output Current of Rectifiers
K	Cathode
MA	Milliamperes
P	Plate
Rk	Self-bias Cathode Resistance in Ohms
Rl	Plate Circuit Resistance
Spl	Special
μmhos	Micromhos (Mutual Conductance)
VAC	Volts AC
VDC	Volts DC

Quality Test

Tube	Test Card	Full Scale Umhos	Ma	Volts	H-K	Test Condition
101D	1 of 1	-	16	-	-	Ef = 4. 5 VAC Eb = 150 Ec = -10. 2 Ib measured
101F	1 of 1	1400	-	-	-	Ef = 4. 1 VDC Eb = 130 Ec = -8. 0 G-P Gm measured
101FA	1 of 1	1900	-	-	-	Ef = 4. 1 VDC Eb = 130 Ec = -8. 0 G-P Gm measured
101L	1 of 1	1600	-	-	-	Ef = 4. 1 VDC Eb = 160 Ec = -10. 0 G-P Gm measured
101M	1 of 1	1600	-	-	-	Ef = 3. 75 VDC Eb = 160 Ec =-10. 0 G-P Gm measured
102D	1 of 1	-	1.50	-	-	Ef = 2. 1 VAC Eb = 150 Ec = -2. 0 Ib measured
102F	1 of 1	900	-	-	-	Ef = 2. 1 VDC Eb = 160 Ec = -2. 0 G-P Gm measured
102L	1 of 1	1000	-	-	-	Ef = 2. 1 VDC Eb = 160 Ec = -2. 0 G-P Gm measured
104D	1 of 1	1300	-	-	-	Ef = 4. 5 VDC Eb = 160 Ec =-35. 0 G-P Gm measured
205F	1 of 1	-	14	-	-	Ef = 4. 5 VAC Eb = 250 Ec = -22. 0 Ib measured
231D	1 of 1	700	-	-	-	Ef = 3. 1 VDC Eb = 90 Ec = -3. 0 G-P Gm measured
244A	1 of 1	1200	-	-	20	Ef = 2. 0 VAC Eb = 150 Ec = -8. 0 G-P Gm measured
245A	1 of 2	INSTRUCTION CARD				
245A	2 of 2	1000	-	-	20	Ef = 2. 0 VAC Eb = 140 Ec2 = manually adjusted to 67.5V Ec1 = -4. 5 G1-P Gm measured
247A	1 of 1	1100	-	-	20	Ef = 2. 0 VAC Eb = 150 Ec = -6. 0 G-P Gm measured

Quality Test

Tube	Test Card	Full Scale Umhos	Ma	Volts	H-K	Test Condition
257A	1 of 1	700	-	-	-	Ef = 3. 1 VDC Eb = 90 Ec = -3. 0 G-P Gm measured
259A	1 of 1	1800	-	-	20	Ef = 2. 0 VAC Eb = 100 Ec2 = 100 Ec1 = -1. 0 G1-P Gm measured
262A/B	1 of 1	1100	-	-	20	Ef = 10. 0 VAC Eb = 160 Ec = -6. 0 G-P Gm measured
264B/C	1 of 1	700	-	-	-	Ef = 1. 5 VDC Eb = 100 Ec = -8. 0 G-P Gm measured
271A	1 of 1	3800	-	-	100	Ef = 5. 0 VAC Eb = 200 Ec = -10. 0 G-P Gm measured
272A	1 of 1	1200	-	-	20	Ef = 10. 0 VAC Eb = 100 Ec = -7. 0 G-P Gm measured
274A	1 of 1	-	280	-	-	Ef = 5. 0 VAC Epp = 250 (F-W) R1 = 1000 Ω C1 = 4 mfd Io measured
274B	1 of 1	-	280	-	-	Ef = 5. 0 VAC Epp = 250 (F-W) R1 = 1000 Ω C1 = 4 mfd Io measured
275A	1 of 1	-	50	-	-	Ef = 5. 0 VAC Eb = 150 Ec = -30. 0 Ib measured
286A	1 of 1	1500	-	-	20	Ef = 2. 0 VAC Eb = 80 Ec2 = 80 Ec1 = -1. 5 G1-P Gm measured
290A	1 of 1	1500	-	-	20	Ef = 10. 0 VAC Eb = 80 Ec2 = 80 Ec1 = -1. 5 G1-P Gm measured

Quality Test

Tube	Test Card	Full Scale Umhos	Ma	Volts	H-K	Test Condition
291A	1 of 2	900	-	-	20	Ef = 10. 0 VAC Eb = 80 Ec2 (Pins 3 & 4 in parallel) = 80 Ec1 = -5. 1 Ec4 = -5. 1 G4-P Gm measured
291A	2 of 2	800	-	-	20	Ef = 10. 0 VAC Eb (Pins 2 & 3 in parallel) = 80 Ec2 = 80 Ec1 = -15. 3 Ec4 = -15. 3 G1-P, G3, G5 Gm measured
293A	1 of 1	1500	-	-	20	Ef = 10. 0 VAC Eb = 180 Ec2 = 180 Ec1 = -18. 0 G1-P Gm measured
294A	1 of 1	1500	-	-	20	Ef = 10. 0 VAC Eb = 180 Ec2 = 180 Ec1 = -18. 0 G1-P Gm measured
300A/B	1 of 1	-	100	-	-	Ef = 5. 0 VAC Eb = 200 Ec = -32. 0 Ib measured
309A	1 of 1	1800	-	-	20	Ef = 10. 0 VAC Eb = 100 Ec2 = 100 Ec1 = -2. 9 G1-P Gm measured
310A	1 of 1	2400	-	-	20	Ef = 10. 0 VAC Eb = 150 Ec2 = 150 Ec1 = -3. 6 G1-P Gm measured
310B	1 of 1	2400	-	-	20	Ef = 10. 0 VAC Eb = 140 Ec2 = 140 Ec1 = -3. 1 G1-P Gm measured
311B	1 of 1	3800	-	-	70	Ef = 9. 0 VAC Eb = 140 Ec2 = 140 Ec1 = -15. 5 G1-P Gm measured
313C	1 of 3	INSTRUCTION CARD				
313C	2 of 3	-	-	100	-	Ebb = 250 Rl = 9220 Ω Ib = 20 MA Starter Etd measured.OK 52 to 74 V

Quality Test

Tube	Test Card	Full Scale Umhos	Ma	Volts	H-K	Test Condition
313C	3 of 3	-	-	100	-	Ebb = 200 Rl = 6020 Ω Ib = 20 MA Anode Etd measured.OK 68 to 90 V
313CA	1 of 3	INSTRUCTION CARD				
313CA	2 of 3	-	-	100	-	Ebb = 250 Rl = 9220 Ω Ib = 20 MA Starter Etd measured.OK 52 to 74 V
313CA	3 of 3	-	-	100	-	Ebb = 200 Rl = 6020 Ω Ib = 20 MA Anode Etd measured.OK 68 to 90 V
313CB	1 of 3	INSTRUCTION CARD				
313CB	2 of 3	-	-	100	-	Ebb = 250 Rl = 9220 Ω Ib = 20 MA Starter Etd measured.OK 52 to 74 V
313CB	3 of 3	-	-	100	-	Ebb = 200 Rl = 6020 Ω Ib = 20 MA Anode Etd measured.OK 71 to 81 V
313CC	1 of 3	INSTRUCTION CARD				
313CC	2 of 3	-	-	100	-	Ebb = 250 Rl = 9220 Ω Ib = 20 MA Starter Etd measured.OK 52 to 74 V
313CC	3 of 3	-	-	100	-	Ebb = 200 R1 = 6020 Ω Ib = 20 MA Anode Etd measured.OK 68 to 88 MA
328A	1 of 1	2400	-	-	20	Ef = 7. 5 VAC Eb = 150 Ec2 = 150 Ec1 = -3. 6 G1-P Gm measured
329A	1 of 1	3800	-	-	70	Ef = 7. 5 VAC Eb = 150 Ec2 = 150 Ec1 = -16. 7 G1-P Gm measured
336A	1 of 1	5200	-	-	50	Ef = 10. 0 VAC Eb = 180 Ec2 = 180 Ec1 = -8. 0 G1-P Gm measured

Quality Test

Tube	Test Card	Full Scale Umhos	Ma	Volts	H-K	Test Condition
337A	1 of 1	2200	-	-	20	Ef = 10.0 VAC Eb = 150 Ec2 = 150 Ec1 = -3.6 G1-P Gm measured
338A	1 of 3		166		*1500	* Meter Full Scale = 1500 μamps Ef = 10.0 VAC Ebb = 150 Ec = 0 Rl = 1350 Ω Ib measured
338A	2 of 3	-	-	100	-	Ef = 10.0 VAC Ebb = 280 Ec = 0 Rl = 2600 Ω Ib = 100 MA Etd measured
338A	3 of 3	-	38	-	-	Ef = 10.0 VAC Ebb = 150 Ec = -36.0 Ib cut-off test OK under 3.8 MA
339A	1 of 1	-	90	-	-	Ef = 5.0 VAC Eb = 150 Ec2 = 150 Ec1 = -12.0 Ib measured
348A	1 of 1	2400	-	-	20	Ef = 6.3 VAC Eb = 140 Ec2 = 140 Ec1 = -3.1 G1-P Gm measured
349A	1 of 1	5200	-	-	50	Ef = 6.3 VAC Eb = 180 Ec2 = 180 Ec1 = -8.0 G1-P Gm measured
350A	1 of 1	8900	-	-	100	Ef = 6.3 VAC Eb = 150 Ec2 = 150 Ec1 = -8.0 G1-P Gm measured
350B	1 of 1	8900	-	-	100	Ef = 6.3 VAC Eb = 150 Ec2 = 150 Ec1 = -8.0 G1-P Gm measured
352A	1	900	-	-	20	Ef = 10.0 VAC Eb = 150 Ec = -6.8 G-P Gm measured
352A	2	-	16	-	20	Ef = 10.0 VAC Ebb = 20 Rl = 1370 Ω Plates in parallel Ib measured OK under 8.0 MA

Quality Test

Tube	Test Card	Full Scale Umhos	Ma	Volts	H-K	Test Condition
352A	3	-	1.2	-	20	Ef = 10.0 VAC Ebb = 20 Rl = 18300 Ω Ib measured Dual Test: 1st P Pin 4 2nd P Pin 3
367A	1 of 1	8900	-	-	100	Ef = 6.3 VAC Eb = 150 Ec2 = 150 Ec1 = -8.0 G1-P Gm measured
373A	1 of 2	1600	-	-	-	Ef = 2.0 VDC Eb = 150 Ec2 = 150 Ec1 = -2.0 G1-P Gm measured G2 Pin 6 used
373A	2 of 2	1600	-	-	-	Ef = 2.0 VDC Eb = 150 Ec2 = 150 Ec1 = -2.0 G1-P Gm measured G2 Pin 5 used
374A	1 of 1	4300	-	-	-	Ef = 3.0 VDC Eb = 150 Ec2 = 150 Ec1 = -18.0 G1-P Gm measured
375A	1 of 1	7800	-	-	20	Ef = 20.0 VAC Eb = 120 Ec2 = 120 Ec1 = -12.0 G1-P Gm measured
381A	1 of 1	-	5.6	-	20	Ef = 6.3 VAC Ebb = 20 Rl = 3570 Ω Ib measured
383A	1 of 1	3500	-	-	20	Ef = 6.3 VAC Eb = 120 Ec = -3.0 G-P Gm measured
385A	1 of 1	3200	-	-	20	Ef = 6.3 VAC Eb = 120 Ec2 = 120 Ec1 = -2.0 G1-P Gm measured
387A	1 of 1	5000	-	-	20	Ef = 6.3 VAC Eb = 120 Ec2 = 120 Ec1 = -2.0 G1-P Gm measured
396A	1	7600	-	-	20	Ef = 6.3 VAC Eb = 150 Rk = 240 Ω G-P Gm measured Dual Test: 1st Triode Pins: 6, 7, 8. 2nd Triode Pins: 2, 3, 4

Quality Test

Tube	Test Card	Full Scale Umhos	Ma	Volts	H-K	Test Condition
398A	1 of 1	6600	-	-	-	Ef = 6.3 VDC Eb = 140 Ec2 = 140 Ec1 = -17.0 G1-P Gm measured
399B	1 of 2	1400	-	-	-	Ef = 1.15 VDC Eb = 90 Ec2 = 90 Ec1 = -1.2 G1-P Gm measured Fil. Pin 1 used
399B	2 of 2	1400	-	-	-	Ef = 1.15 VDC Eb = 90 Ec2 = 90 Ec1 = -1.2 G1-P Gm measured Fil. Pin 5 used
400B	1 of 2	500	-	-	-	Ef = 1.2 VAC Eb = 50 Ec2 = 50 Ec1 = -1.0 Ec3 = -1.0 G3-P Gm measured Fil. Pin 1 used OK over 200 μmho
400B	2 of 2	1500	-	-	-	Ef = 1.2 VAC Eb = 50 Ec2 = 50 Ec1 = -1.0 Ec3 = -1.0 G1-P Gm measured Fil. Pin 5 used
401A	1 of 2	2500	-	-	20	Ef = 6.3 VAC Ec = 90 Ec2 = 90 Ec1 = -5.0 G1-P Gm measured K Pin 7 used
401A	2 of 2	2500	-	-	20	Ef = 6.3 VAC Eb = 90 Ec2 = 90 Ec1 = -5.0 G1-P Gm measured K pin 2 used
403A	1 of 2	6300	-	-	20	Ef = 6.3 VAC Eb = 120 Ec2 = 120 Ec1 = -2.0 G1-P Gm measured K Pin 7 used
403A	2 of 2	6300	-	-	20	Ef = 6.3 VAC Eb = 120 Ec2 = 120 Ec1 = -2.0 G1-P Gm measured K Pin 2 used

Quality Test

Tube	Test Card	Full Scale Umhos	Ma	Volts	H-K	Test Condition
403B	1 of 2	6300	-	-	20	Ef = 6.3 VAC Eb = 120 Ec2 = 120 Rk = 200 Ω G1-P Gm measured K Pin 7 used
403B	2 of 2	6300	-	-	20	Ef = 6.3 VAC Eb = 120 Ec2 = 120 Rk = 200 Ω G1-P Gm measured K Pin 2 used
404A	1 of 3	17,000	-	-	20	Ef = 6.3 VAC Eb = 150 Ec2 = 150 Rk = 110 Ω G1-P Gm measured
404A	2 of 3	-	20	-	20	Ef = 6.3 VAC Eb = 150 Ec2 = 150 Rk = 110 Ω Ib measured OK 8.8 to 18.0 MA
404A	3 of 3	-	0.100	-	20	Ef = 6.3 VAC Eb = 150 Ec2 = 150 Ec1 = -10.0 Ib cut-off test OK under 0.050 MA
407A	1	7600	-	-	20	Ef = 20.0 VAC (parallel) Eb = 150 Rk = 240 Ω G-P Gm measured Dual Test: 1st Triode Pins: 6, 7, 8 2nd Triode Pins: 2, 3, 4
408A	1 of 2	6300	-	-	20	Ef = 20.0 VAC Eb = 120 Ec2 = 120 Rk = 200 Ω G1-P Gm measured K Pin 7 used
408A	2 of 2	6300	-	-	20	Ef = 20.0 VAC Eb = 120 Ec2 = 120 Rk = 200 Ω G1-P Gm measured K Pin 2 used

Quality Test

Tube	Test Card	Full Scale Umhos	Ma	Volts	H-K	Test Condition
409A	1 of 2	4500	-	-	20	Ef = 6.3 VAC Eb = 100 Ec2 = 100 Ec1 = -1.0 Ec3 = 0 G1-P Gm measured
409A	2 of 2	1100	-	-	20	Ef = 6.3 VAC Eb = 100 Ec2 = 100 Ec1 = -1.0 Ec3 = -1.0 G3-P Gm measured
412A	1 of 2	-	144	-	100	Ef = 6.3 VAC Epp = 250 (H-W) Io measured Dual Test: 1st P Pin 9 2nd P Pin 1
415A	1 of 2	4500	-	-	20	Ef = 6.3 VAC Eb = 100 Ec2 = 100 Ec1 = -1.0 Ec3 = 0 G1-P Gm measured
415A	2 of 2	1100	-	-	20	Ef = 6.3 VAC Eb = 100 Ec2 = 100 Ec1 = -1.0 Ec3 = -1.0 G3-P Gm measured
417A	1 of 4	32,000	-	-	20	Ef = 6.3 VAC Eb = 150 Rk = 60 Ω G-P Gm measured G Pin 8 used
417A	2 of 4	-	34	-	20	Ef = 6.3 VAC Eb = 150 Rk = 60 Ω Ib measured G Pin 7 used
417A	3 of 4		34	-	20	Ef = 6.3 VAC Eb = 150 Rk = 60 Ω Ib measured G Pin 5 used
417A	4 of 4	-	0.2	-	20	Ef = 6.3 VAC Eb = 150 Ec = -10.0 Ib cut-off test G Pin 4 used OK under 0.1 MA
418A	1 of 2	32,500	-	-	20	Ef = 6.3 VAC Eb = 150 Ec2 = 150 Rk = 30 Ω G1-P Gm measured K Pin 9 used

Quality Test

Tube	Test Card	Full Scale Umhos	Ma	Volts	H-K	Test Condition
418A	2 of 2	-	62	-	20	Ef = 6.3 VAC Eb = 150 Ec2 = 150 Rk = 30 Ω Ib measured K Pin 4 used
420A	1 of 4	1900	-	-	20	Ef = 6.3 VAC (Parallel) Eb = 180 Ec = -0.5 G-P Gm measured Dual Test: 1st Triode Pins: 6, 7, 8 2nd Triode Pins: 1, 2, 3
420A	2 of 4	-	2.3	-	20	Ef = 6.3 VAC (Parallel) Eb = 180 Ec = -0.5 Ib measured OK 0.8 to 2.1 MA Dual Test: 1st Triode Pins: 6, 7, 8 2nd Triode Pins: 1, 2, 3
420A	3 of 4	-	0.300	-	20	Ef = 6.3 VAC (Parallel) Eb = 110 Rk = 5330 Ω Ib measured OK within 0.045 MA of Card 4 reading. NOTE: For quick Ib balance comparison press #4 with #2 for Triode No. 2
420A	4 of 4	-	0.300	-	20	Ef = 6.3 VAC (Parallel) Eb = 110 Rk = 5330 Ω Ib measured OK within 0.045 MA of Card 3 reading. NOTE: For quick Ib balance comparison press #4 with #2 for Triode No. 1

Quality Test

Tube	Test Card	Full Scale Umhos	Ma	Volts	H-K	Test Condition
421A	1 of 3	18,000	-	-	20	Ef = 6.3 VAC Eb = 120 Ec = -14.0 G-P Gm measured Dual Test: 1st Triode Pins: 4, 5, 6 2nd Triode Pins: 1, 2, 3
421A	2 of 3	-	-	120	20	Ef = 6.3 VAC Ebb = 275 Ec = 0 Rl = 1720 Ω Ib = 125 MA Etd measured OK under 60 volts Dual Test: 1st Triode Pins: 4, 5, 6 2nd Triode Pins: 1, 2, 3
421A	3 of 3	-	20	-	20	Ef = 6.3 VAC Eb = 200 Ec = -55.0 Ib cut-off Test OK under 10 MA Dual Test: 1st Triode Pins: 4, 5, 6 2nd Triode Pins: 1, 2, 3
422A	1 of 1	-	320	-	-	Ef = 5.0 VAC Epp = 250 (F-W) Rl = 1050 Ω Cl = 4 mfd Io measured
423A	1 of 3	INSTRUCTION CARD				
423A	2 of 3	-	-	200	-	Ebb = 200 Rl = 20,000 Ib = 4 MA Etd measured P Pin 8 used OK 99 to 103 volts
423A	3 of 3	-	-	200	-	Ebb = 200 Rl = 14,300 Ib = 6 MA Etd measured P Pin 7 used OK 99 to 103 volts
427A	1 of 3	INSTRUCTION CARD				
427A	2 of 3	-	-	200	-	Ebb(Anode) = 140 Rl(Anode) = 6670 Ebb(Starter) = 145 (manually set) Rl(Starter) = 470,000 Ω Ib(Starter) = 50 microamps Ib(Anode) = 5 MA Etd Anode measured. OK 99 to 103 volts P Pin 6 used

Quality Test

Tube	Test Card	Full Scale Umhos	Ma	Volts	H-K	Test Condition
427A	3 of 3	-	-	200	-	Ebb(Anode) = 140 Rl(Anode) = 1000 Ebb(Starter) = 145 (manually set) Rl(Starter) = 470,000 Ω Ib (starter) = 50 microamps Ib(Anode) = 40 MA Etd Anode measured. OK 99 to 103 volts. P Pin 4 used
429A	1 of 2	8300	-	-	100	Ef = 20.0 VAC Eb = 130 Ec2 = 130 Ec1 = -3.0 G1-P Gm measured P-K Pins: 7, 9
429A	2 of 2	8300	-	-	100	Ef = 20.0 VAC Eb = 130 Ec2 = 130 Ec1 = -3.0 G1-P Gm measured P-K Pins: 2, 4
430A	1 of 3	INSTRUCTION CARD				
430A	2 of 3	-	-	100	-	Ebb = 250 R1 = 9220 Ω Ib = 20 MA Starter Etd measured OK 52 to 74 volts
430A	3 of 3	-	-	100	-	Ebb = 200 Rl = 6020 Ω Ib = 20 MA Anode Etd measured OK 68 to 85 volts
432B	1 of 3	INSTRUCTION CARD				
432B	2 of 3	-	-	200	-	Ebb(Anode) = 110 Rl(Anode) = 2000Ω Ebb(Starter) = 200 (manually set) Rl(Starter) = 470,000 Ω Ib(Starter) = 200 microamps Ib(Anode) = 4 MA Etd Anode measured. OK 99 to 103 volts P Pin 8 used
432B	3 of 3	-	-	200	-	Ebb(Anode) = 110 Rl(Anode) = 1430 Ebb(Starter) = 200 (manually set) Rl(Starter) = 470,000 Ω Ib(Starter) = 200 microamps Ib(Anode) = 6 MA Etd Anode Measured. OK 99 to 103 volts. P Pin 7 used

Quality Test

Tube	Test Card	Full Scale Umhos	Full Scale Ma	Full Scale Volts	H-K	Test Condition
435A	1 of 1	19,000	-	-	20	Ef = 6.3 VAC Eb = 160 Ec2 = 160 EC1 = +7.5 Rk = 630 Ω G1-P Gm measured
436A	1 of 2	38,000	-	-	20	Ef = 6.3 VAC Eb = 160 Ec2 = 160 Ec1 = +7.5 Rk = 310 Ω G1-P Gm measured K pin 3 used
436A	2 of 2	-	0.100	-	20	Ef = 6.3 VAC Eb = 160 Ec2 = 160 Ec1 = -5.6 Ib cut-off test K Pin 2 used OK under 0.010 MA
437A	1 of 2	58,000	-	-	20	Ef = 6.3 VAC Eb = 160 Ec = +7.5 Rk = 260 Ω G-P Gm measured K Pin 8 used
437A	2 of 2	-	46	-	20	Ef = 6.3 VAC Eb = 160 Ec = +7.5 Rk = 260 Ω Ib measured K Pin 7 used
443A	1 of 3	INSTRUCTION CARD				
443A	2 of 3	-	-	100	-	Ebb = 250 R1 = 52,000 Ib = 3 MA Starter Etd measured OK 53 to 72 volts
443A	3 of 3	-	-	100	-	Ebb(Anode) = 150 R1(Anode) = 7560Ω Ebb(Starter) = 93 (Manually set) R1(Starter) = 470,000 Ω Ib(Starter) = 44 microamps Ib(Anode) = 10MA Anode Etd measured OK 63 to 75 volts
448A	1 of 3	40,000	-	-	20	Ef = 6.3 VAC Eb = 140 Ec2 = 140 Ec1 = +7.5 Rk = 270 Ω G1-P Gm measured K pin 7 used

Quality Test

Tube	Test Card	Full Scale Umhos	Full Scale Ma	Full Scale Volts	H-K	Test Condition
448A	2 of 3	-	42	-	20	Ef = 6.3 VAC Eb = 140 Ec2 = 140 Ec1 = +7.5 Rk = 270 Ω Ib measured K pin 6 used
448A	3 of 3	-	0.4	-	20	Ef = 6.3 VAC Eb = 140 Ec2 = 140 Ec1 = -12 Ib, IG2 measured OK 0 to 0.2 MA K pin 3 used